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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,032	11/14/2005	Frank Miller	10191/3696	1223
26646 7590 06/19/2009 KENYON & KENYON LLP ONE BROADWAY NEW YORK, NY 10004				
EXAMINER				
GORMAN, DARREN W				
ART UNIT		PAPER NUMBER		
3752				
MAIL DATE		DELIVERY MODE		
06/19/2009		PAPER		

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/537,032
Filing Date: November 14, 2005
Appellant(s): MILLER, FRANK

Clifford A. Ulrich
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 6, 2009 appealing from the Office action mailed October 10, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 14-17, 19-24, 26 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Krohn et al., USPN 5,947,091.

Krohn (see Figure 1) shows at least one metering device comprising a fuel injection valve (10), which meters fuel into a metering conduit (22); a nozzle body (33, 34, 35) adjoining the metering conduit, the nozzle body having at least one spray discharge opening (opened and closed by valve head member 32) which opens into a metering chamber (60); and at least one electrically operated heating element (23 and 43 in Figure 1, or 23' in Figure 2, or 23'' in Figure 3) with which heat can be delivered to the fuel, including at least one of a wire braid networked in mesh fashion, and a tubular hollow element. Krohn also shows an adapter (50) which joins the metering conduit and metering device in a hydraulically sealed and detachable fashion, the adapter including an air inlet (52; see column 4, lines 55-57) connected in the adapter to the metering conduit (via orifices 54). Krohn also shows at least one embodiment (see Figure 3) wherein at least one (centrally located heating element 23'') of the at least one heating element is immobilized using an attachment element (ceramic material in surrounding relation to centrally located heating element 23'') made of one of plastic, dip resin, or ceramic, and wherein at least

one of the heating element and the attachment element is at least partially surrounded by ceramic (ceramic material in surrounding relation to the outer, concentrically located heating element 23’’). Also, Krohn discloses a controller which regulates heat output to the heating element (see column 3, line 66, through column 4, line 8). Further, Krohn discloses that the heat output of the heating element is controlled based on temperature signals (i.e. operating parameters), which would be at least indirectly related to a temperature in the metering chamber (see again column 3, line 66, through column 4, line 8). Krohn further shows at least a portion of the metering conduit as having varying wall thickness, thus there is at least one “reduced” wall-thickness region. As to the preamble recitation, “for input into a chemical reformer in order to recover hydrogen or into a post-combustion device in order to generate heat”, such recitations are not given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krohn et al.

Krohn shows all of the elements recited in claim 24, however Krohn is silent as to a specific fuel pressure operating range of the fuel injection valve. It should be noted that the opening pressure of the outlet valve (30) for the spray discharge orifice of Krohn is expressly disclosed as being between 2000-4000hPa (i.e. 2-4 bar; see column 4, lines 40-42). Thus, even though the fuel pressure operating range of fuel injection valve (10) is not expressly disclosed by Krohn, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a fuel injection valve that operates at fuel pressures below 10 bar, for the fuel injection valve of Krohn, since fuel injection valve operating pressures of above 10 bar in the device shown by Krohn would likely prematurely open the outlet valve without properly vaporizing the fuel as intended, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955).

(10) Response to Argument

A. Rejection of Claims 14 to 17, 19 to 24, 26 and 28 Under 35 U.S.C. § 102(b)

With respect to claim 14, Appellant first argues that the final Office action does not refer to any portion of Krohn et al. that discloses a heating element that delivers heat at least to a part of at least one of a metering conduit, an adapter, a metering device, and a nozzle body. As correctly indicated by Appellant, the Examiner has applied the element designated with reference number “22” to the recited “metering conduit”, reference number “50” to the recited “adapter”, reference number “10” to the recited “metering device”, and reference numbers “33, 34 and 35” to the recited “nozzle body”, all of which can clearly be seen in Figure 1 of Krohn et al. Appellant goes on to argue that Krohn et al. does not disclose, or even suggest, that any of the

heating elements (identified by the Examiner as elements 23, 23', 23" and 43) deliver heat to any of the elements of Krohn et al. identified by the Examiner to anticipate the recited "metering conduit", "adapter", "metering device" and "nozzle body".

In response to the above arguments, it is the Examiner's position that the claim 14 recitation, "wherein the heating element delivers heat at least to a part of at least one of the metering conduit, the adapter, the metering device, and the nozzle body" is clearly anticipated with the structure shown by Krohn et al., and such is further clearly and expressly disclosed within the reference to Krohn et al. As correctly referred to by Appellant in the appeal brief, the Examiner responded in the final Office action by citing column 5, lines 35-38 of Krohn et al., which states, "Depending on the shape of the injected fuel stream, some of the liquid fuel may also strike the inside surface of receptacle sleeve 22, where it is also evaporated if receptacle sleeve 22 is hot enough.". Appellant argues that this statement does not disclose any application of heat from the heating elements to the receptacle sleeve. The Examiner disagrees with this statement. As specified in column 5, lines 26-38, the heating elements "23, 23', 23" and 43" are the only elements which are capable of applying heat to the device shown in Figure 1. The passage cited above and in the final Office action by the Examiner states, in essence, that at least some of the fuel is evaporated by the "receptacle sleeve 22" (i.e. the metering conduit) if it is *hot enough*. Clearly, Krohn et al. is disclosing that the receptacle sleeve receives heat by saying "if receptacle sleeve 22 is hot enough". Thus, if the only heat applying elements of the device shown in Figure 1 are the heating elements "23, 23', 23" and 43", then it is clear that the heat received by the metering conduit 22 is transferred from at least one of the identified heating elements. Further, although the following additional response to the arguments was not set forth

by the Examiner in the final Office action, the Krohn et al. patent clearly and expressly discloses an additional teaching of a heating element delivering heat to at least a part of at least one of the recited elements of the claimed device. For instance, in column 5, lines 42-44, Krohn et al. states that the fuel is “additionally heated by heating element 43 and by outlet valve 30 which is *also heated by the heating element*”. As disclosed by Krohn et al. (see column 4, lines 18-29), the outlet valve is the broad combination element “30”, which includes the subcombination elements “33, 34 and 35” applied by the Examiner to anticipate the recited “nozzle body”. Thus, if the outlet valve 30 of Krohn et al. is heated by heating element 43, then the heating element 43 clearly delivers heat to at least a part of the nozzle body, which consists of the subcombination elements 33, 34 and 35, which partially make up the disclosed outlet valve 30.

Further, even if the disclosure of Krohn et al. did not expressly and clearly teach the delivery of heat to at least a part of at least one of the recited elements, based on what is shown by Krohn et al., it is clear that all of the heating elements “23, 23', 23" and 43” would apply at least some heat to at least a part of at least one, if not all, of the recited “metering conduit”, “adapter”, “metering device”, and “nozzle body” by convection and/or conduction. For instance, as can clearly be seen in Figure 1 of Krohn et al. (see locations indicated by the bold arrows below), heating elements “23” are in direct contact with the metering conduit “22”, and heating element “43” is in direct contact with portion “34” of the nozzle body. Thus, heat by at least conduction, would be applied to at least a part of at least the metering conduit and at least a part of at least the nozzle body through such direct contact.

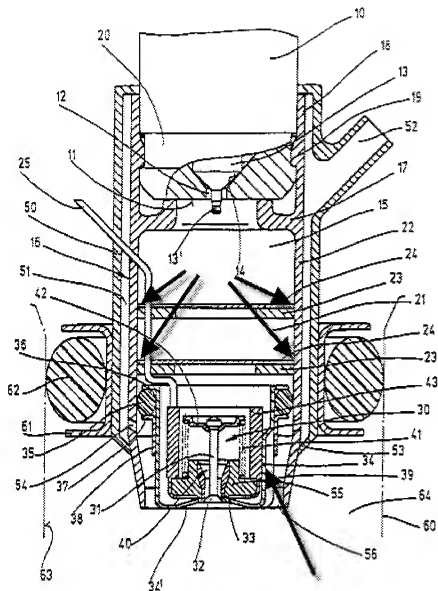


Fig. 1

Appellant's final argument regarding claim 14 is with respect to the recitation, "and wherein the fuel is heated into an entirely vapor phase", which was added to the end of claim 1 by Appellant in an after final amendment filed December 10, 2008. As clearly stated in the advisory action mailed December 19, 2008, Krohn et al. discloses in at least two places (see

Abstract, lines 5-7; and see column 2, lines 2-3) that “complete vaporization” occurs with the disclosed device. In response to this position taken by the Examiner in the advisory action, Appellant argues in the appeal brief that although such is expressly disclosed by Krohn et al., “It does not necessarily follow that complete vaporization occurs prior to entry into the metering chamber, as must be the case in the present claim.” It is the Examiner’s position that such an argument is not commensurate with what is recited in claim 14. Again, claim 14 recites, “and wherein the fuel is heated into an entirely vapor phase”. There is nothing in claim 14 reciting complete vaporization *occurring prior to entry into the metering chamber*, as argued.

B. Rejection of Claim 25 Under 35 U.S.C. § 103(a)

Appellant's only argument set forth under this section heading in the appeal brief is that claim 25 ultimately depends from claim 14, thus Applicant submits that claim 25 is allowable for its dependency on claim 14. Since this argument does not challenge the validity of the rejection of claim 25 under 35 U.S.C. 103(a), other than for its dependency on claim 14, there is no valid argument for the Examiner to rebut with respect to the rejection of claim 25 in the final Office action.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Darren W Gorman/

Primary Examiner, Art Unit 3752

June 11, 2009

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